

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Frederick Johannes Bruwer
Application No.: 10/014,664 Group No.: 2131
Filed: December 14, 2001 Examiner: A. Moorthy
For: METHOD AND APPARATUS FOR TRANSFERRING DATA

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ATTENTION: Board of Patent Appeals and Interferences

APPEAL BRIEF
(37 C.F.R. § 41.37)

This brief is in furtherance of the Notice of Appeal, which was filed in this case on July 30, 2008, and requested reinstatement of the previously filed Appeal pursuant to the provisions of MPEP §1204.01. Thus, the \$255 appeal fee required under 37 C.F.R. § 41.20, which was paid on February 1, 2008 for the previous appeal, can be applied here as set forth in the accompanying TRANSMITTAL OF APPEAL BRIEF.

The following sections are included as required by 37 C.F.R. 41.37(c) (1):

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I REAL PARTIES IN INTEREST
(37 C.F.R. § 41.37(c) (1) (i))

The real party in interest in this appeal is the assignee of record of the subject application,
AZOTEQ (PTY) LTD of Paarl, South Africa.

II RELATED APPEALS AND INTERFERENCES

(34 C.F.R. § 41.37(c) (1) (ii))

With respect to other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in this appeal, there are no such appeals or interferences.

III STATUS OF CLAIMS
(37 C.F.R. § 41.37(c) (1) (iii))

A. TOTAL NUMBER OF CLAIMS IN APPLICATION

The number of claims in the application is 63.

B. STATUS OF ALL OF THE CLAIMS IN APPLICATION

1. Claims canceled: 1-24, 38
2. Claims withdrawn from consideration but not canceled: none
3. Claims objected to: none
4. Claims allowed or confirmed: none
5. Claims rejected: 25-37; 39-63

C. CLAIMS ON APPEAL

The claims on appeal are: 25-37; 39-63. See Appendix in Section VIII for listing.

IV STATUS OF AMENDMENTS
(37 C.F.R. § 41.37(c) (1) (iv))

No Amendments have been filed since the last Office Action was mailed.

V SUMMARY OF CLAIMED SUBJECT MATTER
(37 C.F.R. § 41.37(c) (1) (v))

The invention recited in independent claims 25 and 52 relates to a method and apparatus, respectively, for securely transferring data between a transmitter and a receiver. Typical applications of the invention include wireless remote controllers for garage door openers, door locks, remote keyless entry systems, gate controllers etc. It is normally a requirement in these security related applications that only authorized remote controllers are able to communicate with the receiver that controls actuation of a device and transfers commands. The subject invention specifically relates to a method and apparatus for insuring that only authorized remote transmitter encoders can transfer commands to a receiver decoder.

The invention represents an improvement on a known technique disclosed in Yoshizawa, EP 0311112 A2, which is of record in the subject application. In Yoshizawa's system, clocks or timers in a transmitter and a receiver are first synchronized with one another by being simultaneously reset to a common initial value e.g. zero. The value of the transmitter timer is then sent to the receiver each time the transmitter communicates with the receiver. The receiver compares its timer value with the received transmitter timer value. If the two values match, then this confirms that the transmission is from an authorized transmitter. If the values do not match, then the transmission is not from an authorized transmitter and the receiver will not permit actuation of the controlled device.

The present invention avoids the need for resetting the transmitter and receiver timers for normal operation, which is a notable drawback of Yoshizawa's system if multiple remote control transmitters are employed as is a typical requirement for applications such as door locks, vehicle remote keyless entry (RKE) systems and garage door controllers. As noted before, during the synchronization step in Yoshizawa, the transmitter and receiver timers must be reset at the same

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(37 C.F.R. § 41.37(c) (1) (v))

instant. This makes it totally impractical, if not near impossible, to use more than one transmitter with a single receiver because all of these devices would have to be reset at the same instant.

The subject claimed invention overcomes the aforementioned drawback of the Yoshizawa system by providing a system that does not require reset of the system device timers for synchronization. Instead, the invention recited in independent claims 25 and 52 employs what is referred to as a Timer Relationship Value (TRV) which is generated from the mathematical difference between the values of the transmitter and receiver timers and is independently calculated for each transmitter in the system.

Referencing the Description of Preferred Embodiment section at paragraph [0066] on page 14, an encoder 10 is shown in Figure 1 which forms part of a transmitter. The encoder 10 includes a continuously running timer 22, from which is derived, a timer information portion 30 of a dataword 28 as discussed in paragraph [0072] on page 15 and illustrated in Figure 5. Figure 6 illustrates a transmission word 70 which includes, among other values, an encrypted version 74 of the data word 28 as discussed in paragraph [0080] on page 16. The transmission word 70 is transmitted to a receiver decoder 80 as illustrated in Figure 3, at which the word is decrypted. As discussed in paragraph [0083], the decoder 80 includes a decoder timer 86.

A learning process is discussed beginning on page 19 in paragraph [0085]. As discussed in the specification in paragraphs [0088] and [0089] on page 20, the TRV (referred to as Tr value in the spec) is generated during the learning process. During this process, the decoder 80 receives identification information from the transmitter encoder 10, including the value of the encoder timer 22 and determines the difference between the encoder timer value and the decoder timer value at that instant. For example, if the transmitter encoder timer value is “120” and the

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receiver decoder timer value is “1243, then the TRV would be $1243-120=1123$. The TRV is stored in the decoder 80 and is then used each time a data transmission (e.g. command) is received from the transmitter encoder. During operation, the difference between the encoder and decoder timer values is calculated and then compared to the TRV stored in the decoder 80. If the difference is within a certain amount of the stored TRV, this then confirms that the received signal is from the transmitter encoder that was authorized during the learning process and the command will be executed. However, if it differs more than the certain amount, then the command is assumed to be from an unauthorized transmitter and will not be executed.

The foregoing receiver decoder operation, wherein the TRV of the incoming transmission word from the encoder is analyzed to verify the authenticity of the transmitter encoder, is illustrated in Figure 11 and discussed in paragraphs [00140]-[00143] on pages 31-32.

Method claim 25 thus recites a method of securely transferring data from an encoder to a decoder, wherein the encoder includes an encoder timer and the decoder includes a decoder timer. The method carries out the steps discussed above wherein during a learning process, the value of the encoder timer is received at the decoder which determines a mathematical difference value between the values of the encoder and decoder timers. This difference is stored as a timer relationship value in the decoder. Now, during normal operation, a data word is encrypted at the encoder to form a transmission word, the data word including information identifying a present value of the encoder timer. The transmission word is transmitted to the decoder, which decrypts the transmission word and determines the mathematical difference value between the present encoder and decoder timer values. Finally, the transmission word is validated by comparing the

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mathematical difference value between the present encoder and decoder timer values with the timer relationship value stored in said decoder.

Claim 52 is essentially an apparatus version of claim 25 and discloses an apparatus for transferring data which includes the encoder and decoder recited in claim 25, wherein the decoder includes a decoder timer, a receiver unit for receiving the encrypted transmission word, a decryption unit for decrypting the received transmission word to extract, at least, the timer information from the encoder, a difference determination unit for determining the mathematical difference value between the encoder and decoder timer values, and a comparator unit for comparing the mathematical difference value and the timer relationship value stored in the decoder, to determine the validity of the transmission word. As in claim 25, claim 52 specifies that the timer relationship value is established during a learning process of the encoder and decoder and is representative of the mathematical difference between the value of the encoder timer that is received by the decoder during the learning process and the value of the decoder timer during the learning process.

Dependent claim 60 is the only claim on appeal that employs means plus function language pursuant to 35 U.S.C. 112, paragraph six. This claim is actually similar in scope to claim 52. The claim recites a decoder for use in the method of claim 25 which includes a timer, an input to receive the transmission word, a decryption unit to decrypt the transmission word and obtain the transmitted timer information, memory to store the timer relationship value and a comparison unit to compare the transmitted timer information to time information generated by the decoder timer and to the stored timer relationship value, and means, responsive to the comparison unit, to activate an output if certain criteria are met in the comparison. The

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comparison unit and the last, means plus function element are actually carried out by software modules in the decoder 80 as discussed in paragraphs [00139]-[00143] on pages 31 and 32 of the specification and illustrated in Figure 11.

VI GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL
(37 C.F.R. § 41.37(c) (1) (vi))

1. Whether claims 25-37 and 39-60 fail to comply with the written description requirements of 35 U.S.C. 112, first paragraph.

2. Whether claims 25-30, 34-37 and 39-60 are anticipated under 35 U.S.C. 102(b) by Bruwer, U.S. Patent No. 5,686,904.

3. Whether claim 31 is unpatentable under 35 U.S.C. 103(a) over Bruwer, U.S. Patent No. 5,686,904, in view of Belt et al, U.S. Patent No. 5,446,904.

4. Whether claims 32, 33 and 61-63 are unpatentable under 35 U.S.C. 103(a) over Bruwer, U.S. Patent No. 5,686,904, in view of Rysko et al, U.S. Patent No. 5,155,729.

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(37 C.F.R. ' 41.37(c) (1) (vii))

1. REJECTION OF CLAIMS 25-37 AND 39-60 UNDER 35 U.S.C. 112

As set forth on page 3 of the Office Action, claims 25-37 and 39-63 stand rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. In support of this rejection, the Examiner asserts that the claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. In particular, the Examiner asserts that there is no support in the specification for the limitation "mathematical difference" as recited in independent claims 25 and 52.

The foregoing rejection of the claims was already overcome in the Office Action mailed on May 1, 2007, but has now been reinstated by the Examiner in the latest Office Action. Applicant respectfully submits that the Examiner's first decision to remove this rejection was correct.

As set forth in MPEP § 2163, to comply with the written description requirement of 35 U.S.C. 112, paragraph 1, or to be entitled to an earlier priority date or filing date under 35 U.S.C. 119, 120, or 365(c), each claim limitation must be expressly, implicitly, or inherently supported in the originally filed disclosure. MPEP § 2163 (I) (B) specifically states "[w]hile there is no *in haec verba* requirement, newly added claim limitations must be supported in the specification through express, implicit, or inherent disclosure." This statement unequivocally means that the actual terms used in the claims need not be present in the specification if the terms are supported through express, implicit or inherent disclosure.

It is clear from the written description that the difference value referred to in the claims is indeed a "mathematical" difference value that is obtained when one number is subtracted from

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(37 C.F.R. ' 41.37(c) (1) (vii))

another. Applicant respectfully submits that adding the term “mathematical” to “difference” in claims 25 and 52, though not expressly appearing in the specification, is clearly implicitly or inherently supported by the disclosure. In paragraph [0089] on page 20 of the specification, for example, the difference is clearly defined as being the value obtained by subtracting one timer value from the other timer value. This is obviously the mathematical difference between the two values. The reason the term “mathematical” was added to the claims was to avoid any possible confusion that the difference could be more generally construed to mean that one value is not the same as the other value.

In view of the foregoing, Applicant respectfully submits that the rejection of the claims under 35 U.S.C. 112, first paragraph, is in error and should be REVERSED.

2. REJECTION OF CLAIMS 25-30; 34-37 AND 39-60 UNDER 35 U.S.C. 102

Introduction

In the previous Office Action mailed May 1, 2007, claims 25-30; 34-37; and 39-60 claims stood finally rejected as being anticipated under 35 U.S.C. 102 by Farris et al. In the original Appeal Brief, which was filed on February 1, 2008, Applicant pointed out in extensive detail why the rejections of these claims over Farris et al. were completely without merit. In the final Office Action, the Examiner made no effort to point out how each and every element in the rejected claims were disclosed in Farris et al., but merely made baseless assertions that the elements of the rejected claims were disclosed through general reference to large passages in Farris et al. Applicant was frankly astonished that the Examiner had made the rejections final and had forced Applicant to spend needless time and money on an Appeal.

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(37 C.F.R. ' 41.37(c) (1) (vii))

Now, Applicant is even more astonished that in response to Applicant's first Appeal Brief, the Examiner has issued another new set of rejections in the Office Action of April 30, 2008. This time, the same claims have been rejected under 35 U.S.C. 102 as being anticipated by Applicant's own previous patent, US 5,686,904 (hereinafter, "Bruwer '904"), which no more discloses the elements of the rejected claims than did Farris et al. In fact, as will be discussed in detail below, Bruwer '904 discloses the same type of known prior art rolling code device that is disclosed in Farris et al. As a result, Applicant finds himself in the totally unjustified position of having to defend against another baseless rejection issued by Examiner Moorthy. Applicant's application has now been pending for almost 7 years now and the baseless rejections that Examiner Moorthy has issued are depriving Applicant of patent rights to which he is clearly entitled based on the prior art of record. A detailed discussion of why the claim rejections over Bruwer '904 are completely without merit follows.

At the outset, it is fundamental that in order for a reference to anticipate a claim under 35 U.S.C. 102, the reference must disclose each and every element recited in the claim. Further, while MPEP § 2111 sets forth that claims must be given their broadest reasonable interpretation, it is also well established that this interpretation must be consistent with the specification.

As will be established herein, the rejections of claims 25-30, 34-37 and 39-60 as being anticipated under 35 U.S.C. 102, are completely without merit.

Claims 25 and 52

In Section 7 of the Office Action mailed April 30, 2008, the Examiner asserts that each element of independent claims 25 and 52 is disclosed in Bruwer '904. This assertion is clearly erroneous for the following reasons.

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(37 C.F.R. ' 41.37(c) (1) (vii))

As will be shown in the detailed analysis below, Bruwer '904 discloses a system similar to the one disclosed in the previously cited Farris Jr. patent that is based on a known technique referred to as "rolling code" in which each time the remote transmitter is actuated by a user, e.g. to open a garage door, a rolling code generated by the transmitter is changed. This rolling code is then sent to the receiver which compares the rolling code to a previously stored rolling code in the receiver to determine the authenticity of the transmission from the transmitter. The Bruwer '904 patent system is clearly not a timer based system in which continuously changing timer values are compared, but instead is based on a purely event driven counter to change the contents of the data word that will be encrypted. While it is true that a digital timer, for example, can be referred to as a counter that is synchronized to count intervals of time, the counters employed in Bruwer '904 count events, i.e. user initiated transmitter actuations, which clearly are not time based. This is a fundamental difference with significant shortcomings which the present claimed invention set to solve by introducing timers in both the encoder and decoder. Due to this difference, there is no need for most of the key elements of the claimed subject invention in Bruwer '904's system and thus most of the elements are not disclosed in Bruwer '904. More particularly, with specific reference to claim 25, Bruwer '904 fails to disclose the bolded elements of the claim below:

25. A method of securely transferring data from an encoder to a decoder,
said encoder including an encoder timer and said decoder including a
decoder timer, said method including the steps of:

(a) during a learning process **receiving a value of said encoder timer**

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(37 C.F.R. ' 41.37(c) (1) (vii))

at said decoder and determining a mathematical difference value between

said value of said encoder timer and a value of said decoder timer;

(b) storing said mathematical difference value as a timer

relationship value in said decoder;

(c) at the encoder encrypting a data word to form a transmission word, said data word including information identifying a present value of said encoder timer;

(d) transmitting the transmission word to the decoder;

(e) at the decoder decrypting the transmission word; and

(f) determining a mathematical difference value between said present encoder timer value and a present decoder timer value; and

g) validating the transmission word by comparing the mathematical difference value between said present encoder timer value and said present decoder timer value with said timer relationship value stored in said decoder.

The Examiner's assertions in the Office Action of where Bruwer '904 discloses the above elements of claim 25 establish in and of themselves that Bruwer '904 does not anticipate claim 25. First, in support of the assertion that Bruwer '904 discloses the language in step a) of "receiving a value of said encoder timer at said decoder and determining a mathematical difference value between said value of said encoder timer and a value of said decoder timer," the Examiner notes:

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(37 C.F.R. ' 41.37(c) (1) (vii))

“(i.e. Bruwer discloses that the signal which is received by the decoder 12 using the data transfer interface 13 is converted to a logic signal which, in turn, is converted by the format detector 32, to a number which is applied to the decoder 34. The detector may be a pulse width modulation code detector. The decoding algorithm of decoder 34 decodes the variable portion of the number yielding counter and management code information, the integrity of which is checked by the part 35 using management code information in the storage 45, to verify the validity of the decoding operation. If it is valid, the unit 36 compares the decoded counter information with counter information held in the storage 46 to determine that the decoded number is valid and has not been used before. If the reception is valid then the relevant outputs are activated by the output management function 38) [column 12, lines 31-45]” (Office Action, pg. 4)

Nowhere in the above excerpt from Bruwer ‘904 is there any mention or suggestion that an encoder timer value is received by the decoder and compared to a decoder timer value to form a difference value, which difference value is then stored in the decoder. Instead and as the Examiner notes, the decoder compares the received encoder counter with counter information that was stored in the decoder memory. Under valid operations the stored counter value in the decoder is exactly the previously received encoder counter value. This is definitely not the same as comparing a received timer value (for example 23605 seconds) with an independently running timer value in the decoder (e.g. 160,250 seconds), forming a mathematical difference value between the two (i.e. subtracting one value from the other) and then comparing that difference value to a difference value stored in the decoder.

In support of the assertion that Bruwer ‘904 discloses step b) of claim 25, “storing the mathematical difference value as a timer relationship value in the decoder,” the Examiner cites the same passage from Bruwer ‘904 and simply states:

“i.e. Bruwer discloses that the value is a counter value” (Office Action, page 4).

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(37 C.F.R. ' 41.37(c) (1) (vii))

This comment is irrelevant and simply confirms the fact that Bruwer '904 does not disclose storing a mathematical difference value between an encoder received value and a decoder value as a TRV (timer relationship value). Once again, there is no need for a TRV in Bruwer '904 system because the decoder is not operating or changing independently from the encoder as in the claimed subject invention. The section in Bruwer '904 that is cited by the Examiner clearly states at col. 12, lines 40-42: "If it is valid, the unit compares the decoded counter information with the counter information held in storage 46," but by no means is there any suggestion that the counter information held in storage 46 was formed by calculating the mathematical difference between two timer values.

Regarding the assertion that Bruwer '904 discloses step c) of claim 25, "at the encoder encrypting a data word to form a transmission word, the data word including information identifying a present value of the encoder timer," the Examiner states the following:

“(i.e. Bruwer discloses that for hopping code operation the non-linear encoding algorithm of encoder 18 uses the respective encoding key 64 to encode the counter information 66 and the management code 68 together with the 4 bit function code 52. The 32 bit output code 70 is presented to the serial code generator 26. The counter information 66 is altered each time a transmission takes place for the respective virtual encoder) [column 18, lines 40-52]” (Office Action, pages 4-5)

Again, the counter information 66 is not a timer value, because it is not time-based, it is event driven as already noted. The section cited by the examiner clearly states that “The counter information 66 is altered each time a transmission takes place.” This is in line with the basic concept of Bruwer '904 approach, i.e. that the counter is event driven so that the device can

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switch off and use virtually no power between events (transmissions). Thus, Bruwer '904 clearly does not disclose step c) of claim 25.

Regarding step f) of claim 25, “determining a mathematical difference value between the present encoder timer value and a present decoder timer value,” the Examiner asserts the following:

“(i.e. Bruwer discloses the 32 bit string comprises the original 4 bit function code 52, 16 bits of counter information 66 and the 12 bit management code 68. The integrity checking unit 35 checks for a predetermined relationship between the decoded management code 68, in the decoded word 86 and the stored version 90. If a defined relationship exists the decoding is held to have been valid) [column 19, lines 19-23]” (Office Action, page 5)

Applicant is frankly baffled where in the above passage the Examiner thinks a mathematical difference value between two timers is being determined. There simply no such disclosure in this or any other passage in Bruwer '904. The so-called “predetermined relationship” in the above passage by no means implies that a mathematical difference value is determined.

Finally, regarding step g) of claim 25, “validating the transmission word by comparing the mathematical difference value between the present encoder timer and the present decoder timer value with the timer relationship value stored in the decoder,” the Examiner asserts the following:

“(i.e. Bruwer discloses the decoded counter 66 is compared with the stored counter 94 held in the respective parameter set. If the synchronization proves that the transmission is valid the stored value 94 is updated and the output control function unit 38 is advised accordingly) [column 19, lines 24-28].” (Office Action, pages 5-6)

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The above passage simply reaffirms the fact that Bruwer '904's system compares an encoder counter value and a stored counter value. Once again, this is completely different from the invention recited in claim 25 in which the mathematical difference between an encoder timer and a decoder timer is compared to a stored mathematical difference value, which is the timer relationship value that was established only during the learning operation.

In the support of the rejection of the corresponding independent apparatus claim 52, the Examiner essentially cites the same passages from Bruwer '904. Thus the same reasons discussed above can be applied to confirm that the key elements of claim 52 also are not disclosed in Bruwer '904.

In view of the foregoing, Bruwer '904 clearly fails to anticipate either method claim 25 or corresponding apparatus claim 52. Thus, the rejections of independent claims 25 and 52, as well as the rejections of each of the dependent claims, are clearly in error and should be REVERSED.

In addition, most of the dependent claims recite additional elements and features of the subject invention that are also not disclosed in Bruwer '904, thus providing additional reasons why these claims are not anticipated by Bruwer '904. A discussion of these claims follows.

Claims 26-29

Claim 26 is dependent on claim 25 and recites that the timer relationship value in the decoder is updated upon receipt of a valid transmission word to remove any discrepancies in the relationship between the encoder timer, decoder timer and the timer relationship value, without affecting the decoder timer. In support of the rejection of claim 26, the Examiner asserts the following:

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“ (i.e. Bruwer discloses a synchronization checking unit 36 that verifies the validity of a transmission by comparing incoming counter information 92, produced by the integrity checking unit 35, with stored counter information 94 for the relevant encoder. The counter information 94 corresponds to the information held in the storage location 46 of the decoder 12 of FIG. 1 and includes an error correction function to ensure that the value of the counter is corrected when a spurious error is stored during a power failure [column 17, lines 5-13].” (Office Action, page 6)

As already noted Bruwer ‘904 has no need for and does not disclose a timer relationship value. Thus Bruwer ‘904 cannot anticipate claim 26, which refers to a procedure for updating the timer relationship value. It is apparent that the Examiner is attempting to equate the stored counter value in Bruwer ‘904 with the timer relationship value in claim 26. Even if this was correct, claim 26 specifies that the timer relationship value is updated upon receipt of a valid transmission word, while Bruwer ‘904 specifies that the counter is corrected when a spurious error is stored during a power failure. This statement simply does not support the assertion that the counter is updated upon receipt of a valid transmission word. Thus, for this reason also, claim 26 is not anticipated by Bruwer ‘904. The same applies to claims 27-29, which are directly or indirectly dependent on claim 26.

Claim 34

Claim 34 is dependent on claim 25 and further specifies the step of forming a plurality of transmission words, each transmission word being different from the other transmission words and being based at least on respective encoder high speed timer information, in response to a single activation of the encoder. The Examiner asserts the following in support of the rejection of claim 34:

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“(i.e. Bruwer discloses a specific encoder can either use a single stored parameter set 56 along with various function requests, or different parameter sets with similar or different function requests. Typically, different parameter sets will be used if several different decoders are to be accessed. Several functions 15 might be accessible on each of these decoders. A single encoder might then be configured to access all the decoders, using different parameter sets, and be able to combine different function requests with each of the parameter sets) [column 15, lines 25-33].” (Office Action, page 8)

The above passage discusses the use of different parameter sets, but mentions nothing about forming a plurality of different transmission words in response to a single activation of the encoder, each transmission word being based at least on respective encoder high speed timer information. Claim 34 covers an embodiment of the subject invention discussed, for example, in paragraphs [0081] and [0082] on page 18 of the specification. This embodiment employs a high speed timer that enables the user, for example, to press the transmitter button for 3 seconds and thus transmit 30 transmission words with every one of the 30 words being unique. When decoded the detailed (high resolution) encoder timer data of exactly when the word was transmitted can be recovered and used. The feature recited in claim 34 is clearly not disclosed in the above passage from or anywhere else in Bruwer ‘904. Thus, for this reason also Bruwer ‘904 does not anticipate claim 34.

Claim 39

Claim 39 is dependent on claim 25 and recites that multiple encoders are used with a single decoder comprising a single timer and multiple timer relationship values and wherein the various timer relationship values are determined, one for each encoder during its respective learning process.

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The Examiner cites the following passage from Bruwer '904 as anticipating this limitation:

“(i.e. Bruwer discloses the ability to employ more than one parameter set for an encoder enables the encoder to address more than one decoder without interference, even if a single operating frequency is shared. The encoder appears to be a chosen one of several independent encoders, each of which is capable of independent operation, hence the phrase "virtual encoder". Clearly the encoders are not capable of simultaneous operation. For hopping code operation the nonlinear encoding algorithm of encoder 18 uses the respective encoding key 64 to encode the counter information 66 and the management code 68 together with the 4 bit function code 52. The 32 bit output code 70 is presented to the serial code generator 26. The counter information 66 is altered each time a transmission takes place for the respective virtual encoder. The serial code generator 26 appends the relevant encoder's serial number 62 to the encoded part thereby forming a single output code 72 which is presented to the input of the data transfer interface 11 in PWM serial form (in this example) [column 18, lines 40-57].” (Office Action, page 10)

The above passage discloses in very general terms, the use of multiple encoders in Bruwer '904. However, nowhere in this passage is the limitation of claim 39 wherein multiple timer relationship values are determined, one for each encoder during its respective learning process, disclosed or suggested. Thus, for this reason also Bruwer '904 does not anticipate claim 39.

Claim 40

Claim 40 is also dependent on claim 25 and specifies the step of ensuring that the encoder timer at its slowest variance is faster than the decoder timer at its fastest variance.

The Examiner cites an irrelevant passage from Bruwer '904 as supporting the rejection of claim 40. In particular the Examiner asserts:

“As to claim 40, Bruwer discloses the step of ensuring that the encoder timer at its slowest variance is faster than the decoder timer at its fastest variance [column 17, lines 5-13].” (Office Action, Page 10)

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The cited excerpt from Bruwer '904 reads as follows:

A synchronization checking unit 36 verifies the validity of 5
a transmission by comparing incoming counter information
92, produced by the integrity checking unit 35, with stored
counter information 94 for the relevant encoder. The counter
information 94 corresponds to the information held in the
storage location 46 of the decoder 12 of FIG. 1 and includes 10
an error correction function to ensure that the value of the
counter is corrected when a spurious error is stored during
a power failure.

Nowhere in the above passage is there any discussion of the relative variance between timers, which is not surprising since the system disclosed in Bruwer '904 does not use timers as already discussed. Thus, for this reason also, Bruwer '904 does not anticipate claim 40.

Claims 41, 42

Claim 41 is dependent on claim 39 and recites that if the decoder timer lies within a predetermined window when a valid transmission word is received, the decoder timer is re-synchronised with the encoder timer by automatically adjusting the timer relationship value to remove any discrepancies in the relationship between the timers and the timer relationship value. Nowhere in Bruwer '904 is disclosed the concept of re-synchronizing the encoder timer in the manner recited in claim 41. The Examiner effectively confirms this is the case by citing a the following passage from Bruwer '904 which appears generally relevant taken out of context, but relates to data synchronization timing and bears no relationship to the encoder and decoder timers referred to in the claimed invention:

“(i.e. Bruwer discloses that the decoder includes a detector 32 which has means for compensating for differences in transmission length due to timing differences between the encoder and the decoder) [column 16, lines 54-56]” (Office Action, page 10)

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Regardless of whether the above passage is read in or out of context, the statement simply does not anticipate the language of claim 41 under 35 U.S.C. 102. The same holds true for claim 42, which is dependent on claim 41.

Claims 43-49

The rejections of claims 43-49, 55 and 56 are discussed together because the Examiner relies on the same passage from Bruwer '904, column 21, lines 42-62, as support for the assertion that Bruwer '904 anticipates these claims. At the outset, each of the rejected claims contains language regarding the timer relationship value in claims 25 or 52, which, as already has been demonstrated, is nowhere disclosed in the '904 patent. In addition, these claims further specify details of a feature of the invention wherein a timing window is employed that allows for a certain amount of drift between the encoder and decoder timers.

With specific reference to these claims, claim 43 recites the method of claim 25 wherein the timer relationship value or a window is adjusted in size to compensate for drift between the encoder timer and the decoder timer, before validation occurs, such adjustment being based at least on the time period elapsed since the last adjustment of the timer relationship value.

Claim 44 recites the method of claim 25 wherein the timer relationship value or a window is adjusted in size to compensate for drift between the encoder timer and the decoder timer, such adjustment being based at least on information about the drift between the encoder timer and the decoder timer determined by analyzing at least two successive valid transmissions received with a period of time elapsed between them and said adjustment being performed before carrying out step (f) on a currently received transmission word.

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Claim 45 recites the method of claim 25 wherein a window size is assigned to the decoder and the encoder timer is operated to ensure that the encoder timer information does not fall outside the window for a valid transmission of a transmission word in normal operational circumstances.

Claim 46 recites the method of claim 26 wherein the timer relationship value is allowed a window when validation of the transmission word occurs and the timer relationship value is adjusted based on knowledge of drift between the encoder timer, the decoder timer and the time period elapsed since a previous valid transmission of a transmission word.

Claim 47 is dependent on claim 46 and is similar to claim 43. In particular, claim 47 specifies that the window size is dynamically adjusted and such adjustment is based on the time period elapsed since the previous adjustment of the timer relationship value. Claims 48 and 49 are dependent on claim 47 and recite that the window size has a minimum value and a maximum value, respectively.

Claim 55 recites the apparatus of claim 52 wherein the decoder is assigned a window size which determines acceptable drift between the encoder timer and decoder timer for a valid transmission. Claim 56 recites the apparatus of claim 55 wherein the window size is adjusted before checking the validity of a received transmission word, said adjustment being based at least on the time period elapsed since the reception of a previously received valid transmission word.

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The passage from Bruwer '904 relied upon by the Examiner in support of the rejections of these claims, column 21, lines 42-62, is reproduced below:

At stage 184 it is assumed that a valid learning process has been completed. The next learning pointer (reference 108 in FIG. 3) is updated at stage 186 to point to the next available learning position. Output configuration learning associated with a particular encoder can be included at stage 188 if required. At stage 190 the learning cycle is completed.

FIGS. 5A and 5B respectively illustrate the parameter sets utilized by the encoder and decoder. In the encoder parameter set 56 illustrated in FIG. 5A, there is a 32 bit key generation seed which is used during the learning process to calculate the correct key in the decoder. A 32 bit serial number 62 is a unique number to identify all transmissions from a particular transmitter. There is a 64 bit encoding key for encoding the encoded part of the transmitted information. A 16 bit counter 66 is used for code hopping synchronization checking. This may also include error correction. There is also a 12 bit management code 68 which is a string possibly containing status, mode, and integrity checking information. The management code can also include identity information for distinguishing between the encoders with equal serial numbers and keys.

Applicant is once again baffled by the Examiner's assertions. Clearly, nowhere in this passage, are the elements of claims 43-49, 55 and 56 disclosed or suggested. There is no mention whatsoever of windows or timer drift in the passage. Again, this is not surprising since there are no encoder and decoder timers in Bruwer '904 and as such the handling of drift between the encoder and decoder timers makes no sense in terms of the device in Bruwer '904. Thus, for these reasons also Bruwer '904 does not anticipate any of claims 43-49, 55 and 56.

Claim 50

Claim 50 is dependent on claim 25 and recites that the transmission data word also includes a timer value that changes fast so that each transmission word in a sequence of transmission words which are transmitted based on a single continuous activation of the encoder,

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differs from the other transmission words. This claim also covers the high speed timer embodiment discussed previously in conjunction with claim 34.

The Examiner asserts the following regarding claim 50:

“(i.e. Bruwer discloses that the counter/storage and error correction 16 is updated each time the encoder is actuated. When several parameter sets are used, however, only the counter information in a particular parameter set is updated each time the corresponding virtual encoder is used) [column 15, lines 20-24].” (Office Action, page 12)

Once again, the Examiner has cited a passage from Bruwer ‘904 that has nothing to do with the language in the rejected claim. Nowhere in the above passage, or anywhere else in Bruwer ‘904, is disclosed the use of a transmission data word that includes a timer value that changes fast so that each transmission word in a sequence of transmission words which are transmitted based on a single continuous activation of the encoder, differs from the other transmission words. Thus, for this reason also, Bruwer ‘904 does not anticipate claim 50.

Claims 53, 54

Claim 53 is dependent on claim 52 and adds that the apparatus includes a unit for adjusting the timer relationship value when a valid transmission word is received to remove at least one of: (a) any drift that has occurred; and (b) any other accumulating discrepancy in the relationship between the encoder timer, decoder timer and the timer relationship value.

Claim 54 discloses the apparatus of claim 52 wherein the timer relationship value is adjusted before checking the validity of a received transmission word, such adjustment being based at least on a known drift between the encoder timer and the decoder timer as well as the time elapsed since a previous adjustment of the timer relationship value.

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As in the rejection of claim 41 discussed previously, the Examiner cites column 16, lines 54-56 of Bruwer '904 in support of the assertion that the reference discloses the elements of claims 53 and 54. This passage states that “the decoder includes a detector 32 which has means for compensating for differences in transmission length due to timing differences between the encoder and the decoder.” Again, the section cited by the examiner relates to data synchronization timing and bears no relationship to the encoder and decoder timers referred to in claims 53 and 54. The language in these claims is nowhere found in the passage cited by the Examiner. Thus, for these reasons also, claims 53 and 54 are not anticipated by Bruwer '904.

Claim 57

Claim 57 is dependent on claim 52 and further specifies that a re-synchronization of the encoder and decoder can be achieved by the decoder providing control signals for the encoder inputs.

The Examiner asserts the following in support of his contention that Bruwer '904 anticipates this claim:

“(i.e. Bruwer discloses the controller part 49 of the encoder controls the encoder operation. the control part 49 is connected to each part of the encoder and senses the operational state of each part and provides operational control signals to each part to control the operation and functioning of the encoder as a whole. Encoder commands are received from the external buttons and used to initiate operational control signals to the rest of the encoder. Control signals can consist of encoder mode changes, selection of transmission information and activation of all the different parts as necessary) [column 11, lines 6-15].” (Office Action, pages 15-16)

Once again, nowhere in the cited passage are the limitations of claim 57 found. More specifically, nowhere does the passage say anything about the decoder providing control signals for the encoder inputs. The fact is Bruwer '904 does not disclose communication from a decoder

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to exert any control of or to transfer information to an encoder. Thus, for this reason also, Bruwer '904 does not anticipate claim 57.

Claim 58

Claim 58 is dependent on claim 25 and specifies a transmitter for use with the method, the transmitter including an encoder timer and an encryption unit for encrypting data which at least in part is based on timer information from the encoder timer thereby to form the transmission word, and wherein the encoder timer is permitted to run only for a limited period after each activation of the transmitter.

The Examiner asserts the following in support of his contention that Bruwer '904 anticipates this claim:

“(i.e. Bruwer discloses that the counter value is changed every time the power is disconnected [column 12, lines 6-24].”(Office Action, page 16)

Once again, the cited passage is irrelevant. The fact that a counter value is changed each time the power is disconnected has nothing whatsoever to do with the language in claim 58 that specifies that an encoder timer is permitted to run only for a limited period after each activation of the transmitter. Thus, for this reason also, Bruwer '904 does not anticipate claim 58.

Claim 59

Claim 59 is dependent on claim 25 and specifies a transmitter for use with the method, the transmitter including an encoder timer and an encryption unit for encrypting data which at least in part is based on timer information from the encoder timer thereby to form the transmission word and wherein, when the encoder timer runs beyond a predetermined limit, the

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transmitter will upon a single activation transmit more than one transmission value equivalent to the transmitter being activated twice.

The Examiner asserts the following in support of his contention that Bruwer '904 anticipates this claim:

“(i.e. Bruwer discloses the 32 bit string comprises the original 4 bit function code 52, 16 bits of counter information 66 and the 12 bit management code 68. The integrity checking unit 35 checks for a predetermined relationship between the decoded management code 68, in the decoded word 86 and the stored version 90. If a defined relationship exists the decoding is held to have been valid) [column 19, lines 19-23].” (Office Action, page 16)

Applicant is once again baffled by the Examiner’s assertion that the above passage in any way discloses that when an encoder timer runs beyond a predetermined limit, the transmitter will upon a single activation transmit more than one transmission value equivalent to the transmitter being activated twice. Nowhere in the above passage or anywhere else in Bruwer '904 are the elements of claim 59 disclosed. Thus, for this reason also, Bruwer '904 does not anticipate claim 59.

Claim 60

Claim 60 is dependent on claim 25 and specifies a decoder for use with the method, the decoder including a timer, an input to receive the transmission word, a decryption unit to decrypt the transmission word and obtain the transmitted timer information, memory to store the timer relationship value and a comparison unit to compare the transmitted timer information to time information generated by the decoder timer and to the stored timer relationship value, and means, responsive to the comparison unit, to activate an output if certain criteria are met in the comparison.

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The Examiner asserts the following in support of his contention that Bruwer '904 anticipates this claim:

“(i.e. Bruwer discloses that the decoding algorithm 34 uses the decoder key 82 from the correct memory block, i.e., the respective parameter set, to decode the hopping code 80. A 32 bit output 86 is presented to the integrity checking unit 35) [column 19, lines 13-16]” (Office Action, page 17)

The foregoing passage says nothing about a comparison unit to compare the transmitted timer information to time information generated by the decoder timer and to the stored timer relationship value, and means, responsive to the comparison unit, to activate an output if certain criteria are met in the comparison. Once again, Bruwer '904 does not disclose the additional elements recited in dependent claim 60. Thus, for this reason also Bruwer '904 does not anticipate claim 60.

In view of the foregoing, it is not only clear that Bruwer '904 does not anticipate independent claims 25 and 52, but it is also clear that Bruwer '904 fails to disclose the additional features in dependent claims 26-29, 34, 39-50 and 53-60. As a result, the above discussion provides additional reasons why the rejections of the noted dependent claims are in error and should be REVERSED.

3. REJECTION OF CLAIM 31 UNDER 35 U.S.C. 103(A)

Claim 31 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Bruwer '904 in view of Belt et al. (U.S. Patent No. 5,446,904).

Claim 31 is dependent on claim 30, which is dependent on claim 25, and further specifies that a cold boot counter value, when included in the transmission word, is transmitted in the clear. The cold boot counter feature of the present invention is discussed in paragraphs [0074]-

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[0080] on pages 16 and 17 of the specification. If an encoder suffers a temporary power failure, for example, the encoder's processor must restart and go through a cold boot procedure. The cold boot counter keeps track of the number of cold boots that have occurred. This number is sent as part of the transmission word to the decoder each time the transmitter encoder is actuated by a user. If the cold boot counter is incremented, this tells the decoder that the encoder has suffered a power failure and that the encoder's timer value will therefore no longer be in synchronism with the decoder's timer value. The cold boot counter is thus a mechanism to track the number of cold boots that have occurred to maintain a high security level and overcome the loss of "real time clock" integrity without compromise to security.

Once again, the rejection of claim 31 is completely without merit, not only because Bruwer '904 does not disclose the elements of claim 25, but also because the secondary reference to Belt et al. fails to disclose a cold boot counter as recited in claim 31. This defect in Belt et al. was noted in the previous Appeal Brief and the Examiner did not even address the issue in the latest Office Action. As in the previous Office Action, the Examiner makes the erroneous assertion that Belt discloses a cold boot counter being transmitted in the clear and cites the following passage (Col. 38, lines 52-64) from Belt et al. in support of this assertion:

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Then, at 692, the processor checks the resume flag 383 (FIG. 13). If it is set, then the processor will attempt to configure the system using the set-up information stored in the EEPROM 439 of the SCP. If it is not set, then the system is performing a cold boot and will attempt to configure itself using the set-up information stored in the RAM 377 of the real time clock circuit 376. More specifically, if the resume flag is set to indicate that the system is resuming from suspend mode, then control will proceed from block 692 to block 696, where the system will attempt configuration using the current set-up information stored in the EEPROM 439 of the SCP.

The above passage from Belt only discloses a “resume flag” that can enforce a “cold boot.” This means a cold boot event is activated in response to a flag. However, this has nothing to do with the recitation in claim 31 of a counter value that indicates the number of cold boots that have occurred, this counter value being transmitted in the clear, i.e. not-encrypted. Clearly then, the Examiner’s assertion that Belt et al. disclose the feature of claim 31 is in error. As such, the combination of Bruwer ‘904 with Belt et al. does not establish a prima facie case of obviousness as to claim 31. In fact, this combination of references could not even establish a prima facie case of obviousness as to claim 31 if Bruwer ‘904 anticipated claim 25, which it clearly does not. Thus, for this reason also, the rejection of claim 31 under 35 U.S.C. 103 is clearly meritless and should be REVERSED.

4. REJECTION OF CLAIMS 32, 33 AND 61-63 UNDER 35 U.S.C. 103(A)

Claims 32, 33 and 61-63 stand rejected as being unpatentable under 35 U.S.C. 103(a) over Bruwer ‘904 in view of Rysko et al., U.S. Patent No. 5,155,729. Once again, the grounds of rejection are completely without merit as will be established below.

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Claims 32, 33 and 61-63 all recite various aspects of the cold boot counter feature of the claimed invention, which was discussed in the previous section regarding the rejection of claim 31. More specifically, claim 32 recites the method of claim 25 which includes the step of keeping the encoder and decoder in synchronism using the cold boot counter which is changed each time the encoder is powered up or comes out of reset.

Claim 33 recites the method of claim 25 which includes the steps of keeping the encoder and decoder in synchronism using a cold boot counter which is changed each time the encoder is powered up or comes out of reset, and including a count value of the cold boot counter in the transmission word.

Claim 61 recites the method of claim 25, which includes the step of keeping the encoder and decoder in synchronism using a cold boot counter which is changed each time at least one of the following occurs: the encoder is powered up or comes out of reset, or loses the integrity of its timer/counter unit; and wherein the transmission word includes the encrypted data word and at least a cold boot counter value that may be broken up so that several transmission words are required to transfer the complete cold boot counter value.

Claim 62 is dependent on claim 61 and specifies that the cold boot counter value, or part thereof, when included in the transmission word, is transmitted in the clear.

Claim 63 is also dependent on claim 61 and further specifies that there is a count value of the cold boot counter in the transmission word.

In support of the rejection of the above claims, the Examiner asserts the following on page 18 of the Office Action:

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“Rysko et al teaches a cold boot counter that is changed each time a system is powered up or comes out of reset. Rysko et al teaches including a count value of the cold boot counter in the transmission word. Rysko et al teaches that the cold boot counter value would have been transmitted with the transmission word in the clear [column 6, lines 29-64].”

Column 6, lines 29-64 of Rysko et al. is reproduced below:

Referring to FIG. 2, AOK 116, i.e., active 114 is
30 applied to switchover counter 201 in switchover control logic 120. Switchover counter 201 is, for example, a 7492A divide by 12 counter. Switchover counter 201 counts the number of switchovers which occur by monitoring active signal 114 and incrementing a count
35 whenever active signal 114 changes from active to inactive. Further switchover counter 201 compares its count with a predetermined threshold, in this embodiment for example, the predetermined threshold is 4, and, if the count exceeds the predetermined threshold,
40 switchover counter 201 triggers a cold boot by generating a signal over lead 250 which is applied as input to NOR circuit 204. Further, as one of ordinary skill in the art can readily appreciate, a cold boot is also generated by the output from NOR 199 when both AOK 116 and
45 BOK 117 indicate that both processor side A and processor side B have failed. The output of NOR circuit 204, cold boot signal 11B is applied as input, as is shown in FIG. 1, to processors 104 and 105 to reboot system 10.

50 Timer 202 of switchover control logic 120 periodically clears the count in switchover counter 201 to zero. The time period for periodically resetting the counter of switchover counter 201 is determined, for example, by hardware design and is set thereby to a predetermined
55 value, i.e., R_A , R_B , and C are chosen to select the time period to clear switchover counter 201. A threshold is imposed on this count with respect to time such that only a fixed number of switchovers can occur within a predetermined amount of time. If the threshold is
60 reached within this time period, a cold boot will be started. In accordance with the present invention, it is expected that the cold boot which reloads a “fresh” copy of the programs into memory may correct the problem which is causing the multiple switchovers.

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As with Belt et al., the disclosure in Rysko et al. has nothing whatsoever to do with a cold boot counter. The above passage in Rysko et al. discloses a “switchover counter” which bears no similarity to a cold boot counter. This counter is used in a totally different context as evidenced by this excerpt from Col. 6, line 59: “... if the count (switch over counter value) exceeds the predetermined threshold, switchover counter 201 triggers a cold boot by...” Obviously, the counter triggers a cold boot but has nothing to do with counting the number of cold boots. Accordingly, the combination of Bruwer ‘904 with Rysko et al. does not establish a prima facie case of obviousness under 35 U.S.C. 103 as to claims 32, 33 and 61-63 not only because Bruwer ‘904 does not anticipate either of claims 25 or 52, but also because Rysko et al. does not disclose the additional features recited in the rejected dependent claims. Thus, the rejections of claim 32, 33 and 61-63 under 35 U.S.C. 103 are also in error and should be REVERSED.

5. SUMMARY

Applicant has once again clearly demonstrated that the Examiner’s rejections of the pending claims are completely without merit. The reinstated rejection under 35 U.S.C. 112, first paragraph, is clearly in error since it is obvious from the specification that the difference value referred to is a mathematical difference value. Regarding the prior art rejections, after Applicant demonstrated in the previous Appeal Brief that the Examiner’s rejections based on the Farris et al. were completely without merit, the Examiner has now come forth and rejected the claims over Applicant’s own previous patent, which basically discloses the same type of system as is disclosed in Farris et al. In so doing, the Examiner has once again made rejections of the claims that are totally unsupported by the teachings of the references. The assertions that Bruwer ‘904 anticipates claims 25-30, 34-37 and 39-60 are manifestly incorrect from even a cursory review of

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the subject claims and the disclosure in Bruwer '904. It is bad enough that Bruwer '904 clearly does not anticipate the key features of independent claims 25 and 52, but the suggestion that Bruwer '904 anticipates the majority of the rejected dependent claims is so off base that Applicant questions why the Examiner has issued the rejections, especially in light of the previous Appeal Brief which drew attention to the fact that the rejections over Farris et al. were completely baseless as well. Further, the rejections of claims 31-33 and 61-63 under 35 U.S.C. 103 remain flawed for the very same reasons asserted in the previous Appeal Brief. The secondary references do not even disclose what is recited in these claims and thus could not even establish a prima facie case of obviousness under 35 U.S.C. 103, even if Bruwer '904 did anticipate the independent claims. Accordingly, each of the claim rejections set forth in the Office Action is clearly improper and should be REVERSED.

Respectfully Submitted,

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25. (Previously Presented) A method of securely transferring data from an encoder to a decoder, said encoder including an encoder timer and said decoder including a decoder timer, said method including the steps of:

- (a) during a learning process receiving a value of said encoder timer at said decoder and determining a mathematical difference value between said value of said encoder timer and a value of said decoder timer;
- (b) storing said mathematical difference value as a timer relationship value in said decoder;
- (c) at the encoder encrypting a data word to form a transmission word, said data word including information identifying a present value of said encoder timer;
- (d) transmitting the transmission word to the decoder;
- (e) at the decoder decrypting the transmission word; and
- (f) determining a mathematical difference value between said present encoder timer value and a present decoder timer value; and
- g) validating the transmission word by comparing the mathematical difference value between said present encoder timer value and said present decoder timer value with said timer relationship value stored in said decoder.

26. (Previously Presented) A method according to claim 25 wherein the timer relationship value in the decoder is updated upon receipt of a valid transmission word to remove any discrepancies in the relationship between the encoder timer, decoder timer and the timer relationship value, without affecting the decoder timer.

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27. (Previously Presented) A method according to claim 26 wherein the updating of the timer relationship value is only done when necessary.

28. (Previously Presented) A method according to claim 26 wherein the data word additionally includes at least one of the following: identity information pertaining to the encoder; command information; utility information; cold boot counter information; fixed code information; encoder power supply information and user derived information.

29. (Previously Presented) A method according to claim 28 wherein the user derived information is variable via one or more inputs to the encoder and is not known to a manufacturer of the encoder.

30. (Previously Presented) A method according to claim 25 wherein the transmission word includes the encrypted data word and at least one of the following: a cold boot counter value; command information; and identity information pertaining to the encoder.

31. (Previously Presented) A method according to claim 30 wherein the cold boot counter value, when included in the transmission word, is transmitted in the clear.

32. (Previously Presented) A method according to claim 25 which includes the step of keeping the encoder and decoder in synchronism using a cold boot counter which is changed each time the encoder is powered up or comes out of reset.

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33. (Previously Presented) A method according to claim 25 which includes the steps of keeping the encoder and decoder in synchronism using a cold boot counter which is changed each time the encoder is powered up or comes out of reset, and including a count value of the cold boot counter in the transmission word.
34. (Previously Presented) A method according to claim 25 which includes the step of forming a plurality of transmission words, each transmission word being different from the other transmission words and being based at least on respective encoder high speed timer information, in response to a single activation of the encoder.
35. (Previously Presented) A method according to claim 25 which includes the step of forming only a single transmission word to be transmitted at least once in response to a single activation of the encoder.
36. (Previously Presented) A method according to claim 25 which includes the steps, during a learn mode, of storing learning information at the decoder which is transferred from the encoder, and deriving a key from the stored information.
37. (Previously Presented) A method according to claim 36 wherein the learning information is stored in a first-in-first-out structure.

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39. (Previously Presented) A method according to claim 25 wherein multiple encoders are used with a single decoder comprising a single timer and multiple timer relationship values and wherein the various timer relationship values are determined, one for each encoder during its respective learning process.

40. (Previously Presented) A method according to claim 25 which includes the step of ensuring that the encoder timer at its slowest variance is faster than the decoder timer at its fastest variance.

41. (Previously Presented) A method according to claim 39 wherein, if the decoder timer lies within a predetermined window when a valid transmission word is received, the decoder timer is re-synchronized with the encoder timer by automatically adjusting the timer relationship value to remove any discrepancies in the relationship between the timers and the timer relationship value.

42. (Previously Presented) A method according to claim 41 wherein the re-synchronization is effected by a bi-directional transfer of data between the encoder and decoder.

43. (Previously Presented) A method according to claim 25 wherein the timer relationship value or a window is adjusted in size to compensate for drift between the encoder timer and the decoder timer, before validation occurs, such adjustment being

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based at least on the time period elapsed since the last adjustment of the timer relationship value.

44. (Previously Presented) A method according to claim 25 wherein the timer relationship value or a window is adjusted in size to compensate for drift between the encoder timer and the decoder timer, such adjustment being based at least on information about the drift between the encoder timer and the decoder timer determined by analyzing at least two successive valid transmissions received with a period of time elapsed between them and said adjustment being performed before carrying out step (f) on a currently received transmission word.

45. (Previously Presented) A method according to claim 25 wherein a window size is assigned to the decoder and the encoder timer is operated to ensure that the encoder timer information does not fall outside the window for a valid transmission of a transmission word in normal operational circumstances.

46. (Previously Presented) A method according to claim 26 wherein the timer relationship value is allowed a window when validation of the transmission word occurs and the timer relationship value is adjusted based on knowledge of drift between the encoder timer, the decoder timer and the time period elapsed since a previous valid transmission of a transmission word.

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47. (Previously Presented) A method according to claim 46 wherein the window size is dynamically adjusted and such adjustment is based on the time period elapsed since the previous adjustment of the timer relationship value.

48. (Previously Presented) A method according to claim 47 wherein the window size has a minimum value.

49. (Previously Presented) A method according to claim 47 wherein the window size has a maximum value.

50. (Previously Presented) A method according to claim 25 wherein the transmission data word also includes a timer value that changes fast so that each transmission word in a sequence of transmission words which are transmitted based on a single continuous activation of the encoder, differs from the other transmission words.

51. (Previously Presented) A method according to claim 25 wherein a higher security re-synchronization of the encoder and decoder timers is achieved at least by using the decoder to generate control signals that are used to, directly or indirectly, control the activation of the encoder.

52. (Previously Presented) Apparatus for transferring data which includes an encoder and a decoder and wherein the encoder includes a timer and an encryption unit for

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encrypting data which includes timer information from the encoder timer, thereby to form a transmission word, and the decoder includes a decoder timer, a receiver unit for receiving the encrypted transmission word, a decryption unit for decrypting the received transmission word to extract, at least, the timer information from the encoder, a difference determination unit for determining a mathematical difference value between said encoder timer value and said decoder timer value, and a comparator unit for comparing said mathematical difference value and a timer relationship value stored in said decoder, to determine the validity of the transmission word, the timer relationship value being established during a learning process of the encoder and decoder and being representative of a mathematical difference between a value of said encoder timer that is received by said decoder during said learning process and a value of said decoder timer during said learning process.

53. (Previously Presented) Apparatus according to claim 52 which includes a unit for adjusting the timer relationship value when a valid transmission word is received to remove at least one of:

- (a) any drift that has occurred; and
- (b) any other accumulating discrepancy in the relationship between the encoder timer, decoder timer and the timer relationship value.

54. (Previously Presented) Apparatus according to claim 52 wherein the timer relationship value is adjusted before checking the validity of a received transmission

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word, such adjustment being based at least on a known drift between the encoder timer and the decoder timer as well as the time elapsed since a previous adjustment of the timer relationship value.

55. (Previously Presented) Apparatus according to claim 52 wherein the decoder is assigned a window size which determines acceptable drift between the encoder timer and decoder timer for a valid transmission.

56. (Previously Presented) Apparatus according to claim 55 wherein the window size is adjusted before checking the validity of a received transmission word, said adjustment being based at least on the time period elapsed since the reception of a previously received valid transmission word.

57. (Previously Presented) Apparatus according to claim 52 wherein a re-synchronisation of the encoder and decoder can be achieved by the decoder providing control signals for the encoder inputs.

58. (Previously Presented) For use in the method of claim 25, a transmitter which includes an encoder timer and an encryption unit for encrypting data which at least in part is based on timer information from the encoder timer thereby to form the transmission word, and wherein the encoder timer is permitted to run only for a limited period after each activation of the transmitter.

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(37 C.F.R. ' 41.37(c) (1) (viii))

59. (Previously Presented) For use in the method of claim 25, a transmitter which includes an encoder timer and an encryption unit for encrypting data which at least in part is based on timer information from the encoder timer thereby to form the transmission word and wherein, when the encoder timer runs beyond a predetermined limit, the transmitter will upon a single activation transmit more than one transmission value equivalent to the transmitter being activated twice.

60. (Previously Presented) For use in the method of claim 25, a decoder which includes a timer, an input to receive the transmission word, a decryption unit to decrypt the transmission word and obtain the transmitted timer information, memory to store the timer relationship value and a comparison unit to compare the transmitted timer information to time information generated by the decoder timer and to the stored timer relationship value, and means, responsive to the comparison unit, to activate an output if certain criteria are met in the comparison.

61. (Previously Presented) A method according to claim 25, which includes the step of keeping the encoder and decoder in synchronism using a cold boot counter which is changed each time at least one of the following occurs: the encoder is powered up or comes out of reset, or loses the integrity of its timer/counter unit; and wherein the transmission word includes the encrypted data word and at least a cold boot counter value that may be broken up so that several transmission words are required to transfer the complete cold boot counter value.

VIII CLAIMS APPENDIX
(37 C.F.R. ' 41.37(c) (1) (viii))

62. (Previously Presented) A method according to claim 61 wherein the cold boot counter value, or part thereof, when included in the transmission word, is transmitted in the clear.

63. (Previously Presented) A method according to claim 61, further including a count value of the cold boot counter in the transmission word.

IX EVIDENCE APPENDIX
(37 C.F.R. ' 41.37(c) (1) (ix))

None

X RELATED PROCEEDINGS APPENDIX
(37 C.F.R. '41.37(c) (1) (x))

None